



Interpretation

Section 34. Cable in underground structures

Rule 341B1c Installation—Cable in manholes and vaults—Supports (2007 Edition, page 231) (29 October 2008) IR555

The following questions concern application of Rule 341B1c to enclosures that are so small that a person cannot enter the enclosure.

1. Is an enclosure that is used to support padmounted equipment that is so small that personnel cannot enter the enclosure (sometimes called by such names as “mini-vault,” “basement vault,” “basement,” and other names that do or do not include the word “vault”) considered by the NESC to be a “vault,” a “manhole,” a “handhole,” or some other type of enclosure—regardless of whether the enclosure is:
 - a) entirely below grade
 - b) substantially below grade
 - c) substantially above grade
 - d) entirely above grade
2. If the answer to the above is that this small enclosure is intended by the NESC to be considered as a manhole or vault, Rule 341B1c would appear to apply. However, is Rule 341B1c intended to apply to mini-vaults or is it intended to apply only to large vaults allowing full access by personnel?

Discussion: A particular utility currently has small enclosures that are referred to as mini-vaults in its standards; these enclosures support single-phase padmounted transformers. These mini-vaults have an inside dimensions of 3’ 2” H, 3’ 6” W, and 5’ 6” L, and the vault is equipped with a 24” x 36” access panel in the lid. The access panel is for the line crew to gain better access to the cables for more ease of installation or for replacement of an existing cable. Due to the size of the vault the line crews will never intentionally set foot inside the vault, but there is a possibility that the crews might step in the vault by accident. Please clarify if the mini-vault described above meets the NESC definition of manhole or vault. Although the unit is colloquially termed a mini-vault, this enclosure might technically be a handhole.

The NESC includes the following definitions that may apply.

handhole. An access opening, provided in equipment or in a below-the-surface enclosure in connection with underground lines, into which personnel reach but do not enter, for the purpose of installing, operating, or maintaining equipment or cable or both.

manhole. A subsurface enclosure that personnel may enter used for the purpose of installing, operating, and maintaining submersible equipment and cable.

vault. A structurally solid enclosure, including all sides, top, and bottom, above or below ground where entry is limited to personnel qualified to install, maintain, operate, or inspect the equipment or cable enclosed. The enclosure may have openings for ventilation, personnel access, cable entrance, and other openings required for operation of equipment in the vault.

So-called mini-vaults are typically embedded such that most of the enclosure is below the surface but a few inches are above the surface so that the mounted equipment is not likely to be covered in the event of soil erosion. Some models have a substantial portion above the grade.

It is rare that a line worker does anything with these enclosures except insert a hand and arm into the access opening to guide cable up through the equipment opening. However, there may be an occasion when a line worker would place one or both feet through the access opening to get better position for guiding a cable. In no case can a line worker fully enter the enclosure—it is simply too small.

It could be argued that the NESC definition of handhole is intended to apply to such enclosures as described above. If so, it would appear that Rule 341B1c would not apply since it only refers to cable in manholes or vaults.

In the event that the intention of the NESC is to apply the definition of either manhole or vault to this enclosure, it could be argued that Rule 341B1c was never intended to apply to such small enclosures. Such enclosures rarely have cable supports; cables typically are trained from the conduit up through the equipment access hole.

Interpretation

The Interpretations Subcommittee has considered the subject Interpretation Request for Rule 341B1c and has developed a consensus report as follows:

“The ‘mini-vault’ described above is a handhole under NESC rules; it is neither a vault nor a manhole. See Definitions.

Because it is a handhole, Rule 341B1c does not apply and cable supports are not required. Please note that cable supports are not prohibited should such supports be appropriate in a specific situation.”